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Book Review

GENE THERAPY: A HANDBOOK FOR PHYSICIANS
By Kenneth W. Culver
Mary Ann Liebert, Inc., New York, 1994, 117 pages

The topic of gene therapy is never far from the clinical geneticist's consciousness these days. Here is a book, written by a leader in this rising field, which sets forth the history of the interest in gene therapy, the role of knowledge about the genome in the development of new medical treatments, and an assessment of the expectations for the applicability of this promising new tool. The author hopes to educate physicians and thus, also, benefit patients. It appears that the general physician is the intended audience, but the geneticist who has not been working in gene therapy will find useful information as well.

For the nongeneticist reader, the first few chapters provide a very brief introduction to modern molecular genetics. This is followed by a chapter on the methodology of gene transfer and a description of the adenosine deaminase deficiency (ADA) gene therapy experiment. Applications to single disorders, treatment of cancer, and ethical considerations follow. Five appendices offer a selection of resources, including a list of protocols approved by the NIH Recombinant DNA Advisory Committee (RAC), a glossary, an index of health disorders and their chromosome location, and a discussion of points to consider in the development of gene therapy protocols. References are included at the end of each chapter.

Most of the material reviewed in the first two background chapters is well-known to geneticists. However, the information is clearly covered and accessible, but not too oversimplified. It assumes a good knowledge of medicine and basic science. The chapter titled "Identification of Genes in the Human Genome" offers only the most general of overviews, with no detail. Nor do the references suggest any rigorous, up-to-date reading material. In contrast, the chapter that addresses methods for gene transfer offers more detail, and extensive references. Diagrams are simple and easy to understand. Oddly, liposomal gene transfer is discussed much later, instead of in that chapter.

Culver spends a whole interesting and engaging chapter describing the ADA gene therapy experiment. Along with information about ADA, both clinical and genetic, is a personal account, including photographs, that reflects the author's intimate involvement in that experiment.

Many single-gene disorders are suggested as candidates for the gene therapy approach. All organ systems are represented. The creative thrust behind these ideas is well-represented. Culver is realistic, while at the same time portraying the excitement that surrounds the ideas. Cancer as a candidate for gene therapy receives separate treatment. The relationship between the understanding of cancer at the molecular level and the development of gene therapy is emphasized. Here are descriptions of early experiments both in animals and in humans. Many references follow this chapter.

Nor are the ethical considerations ignored. Questions of somatic gene therapy as distinguished from germline alteration, eugenic concerns, the importance of guidelines, the role of the RAC—All these critical considerations are here. An appendix devoted to "Points to Consider" in developing gene therapy protocols completes this formal consideration of ethical concerns.

If the audience includes general physicians, medical and nursing students, geneticists not active in gene therapy or molecular genetics, and medical teachers, the book finds its target well. Background material and access to the literature are there. The text is readable, and the illustrations simple and clear.

The book's serious weakness is inherent in the topic: it is out of date before it is even written. Published in 1994, there are few references more recent than 1993. Of course, much has happened since then, which is not covered in the book. New ideas about stem cells, further data on human clinical experiments in cystic fibrosis, extensions of the cancer experiments have all come along since its publication.

Its strengths are that it will be useful as a teaching tool, informative for nongenetics physicians, and interesting as a description of the ADA experiment. This book can provide background information that is accessible, and a starting point for reading the literature. Let us hope for a second edition that is larger and describes effective therapeutic advances.

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